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ABSTRACT

U.S. and European models of delivering secondary education were examined to identify ways of improving Latin American and Caribbean secondary schools and easing Latin American and Caribbean students' transition from school to work. The following delivery options were considered: (1) separate job training from formal secondary education; (2) move technical education to the postsecondary level; (3) create tracks within formal secondary education; (4) develop a single national curriculum with electives; (5) build academics into vocational subjects; (6) blend office technology into academics; and (7) maintain a few elite secondary technical schools that are closely linked with industry. The following were among the conclusions that emerged from the analysis: (1) the traditional structure of secondary education is obsolete; (2) because of the diverse situations and cultural traditions existing in the countries of Latin American and the Caribbean, there is no single model of secondary education that can be recommended for all countries in the region; (3) many new alternatives include a progressive separation of vocational preparation from academic streams; (4) regardless of their level and regardless of whether they have ties with academic studies, the most successful technical schools are closely tied to industry; and (5) in all cases, more emphasis must be placed on solving problems rather than on memorizing facts and theories. (Contains 17 references) (MN)

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Secondary Schools and the Transition to Work in Latin America and the Caribbean

Claudio de Moura Castro
Martin Carnoy
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Foreword

The mounting interdependence of markets and the increasing intellectual content of production, require a labor force with stronger skills in mathematics, language and communications as well as more flexibility, creativity and an ability to work cooperatively. Secondary education is critical to the success of nations in this new environment. In order to compete effectively, the countries of Latin America and the Caribbean must address the challenge of preparing students for the transition to work. This paper provides a timely synthesis of the issues, problems, research and current best practice in the region and elsewhere. Among other elements, it discusses the organization of secondary schools in the region and examines the confusing and controversial matter of providing schools for an increasingly heterogeneous clientele. It also explores the triple role played by secondary education systems: preparing students for higher education, forming solid citizens and providing training for those who will end their schooling at this level. This paper is one of the reports prepared as background for the development of the Bank's strategy on primary and secondary education. As such, it should prove useful for policymakers in the region.

Waldemar W. Wirsig
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The Purpose and Structure of Secondary Education

This paper discusses the organization of secondary schools in Latin America and the Caribbean. It deals with the confusing and controversial matters of providing schools for an increasingly heterogeneous clientele and the triple role of preparing students for higher education, forming solid citizens and offering training for those who will finish their schooling at this level. As countries in the region rediscover secondary education following over a decade of neglect and oblivion, they grope for answers that are not there. (Sometimes even the problems are not clear.)

The paper explores the different meanings, functions and problems of secondary education, as well as the various solutions that are being offered. This is a paper about deciding whether to put students together or track them in different institutions; about offering the same content to all or teaching different materials, depending on the profile of students; about using the same delivery strategies or adapting them to groups of students; and about deciding where and when to offer job training and how close to real occupations it will be. There is a lot more to education than these organizational matters. Yet, if the organization patterns are not appropriate to the circumstances, it becomes much harder, if not impossible to offer a good education to today's diverse student body or to the even more diverse student body entering secondary schools.[1]

The first section of this report discusses the nature of the problem worldwide, namely, the difficulties resulting from conflicting roles for secondary schools and the increasing diversity of students, as well as the solutions attempted in Europe and the United States. It then describes the current situation in Latin America and its shortcomings. The third section assesses new trends and options under discussion or being implemented. The last section draws some lessons from the experience and discusses some general trends.

THE MULTIPLE ROLES OF SECONDARY EDUCATION

Like other levels of education, secondary schooling is partly organized around transmitting knowledge, and partly (perhaps mainly) around selection, i.e., who moves farther and who is blocked. The selection process in schools sets expectations, responsibilities, and accountability among teachers, administrators, and parents; it therefore has a major influence on the way schools are organized, and on the teaching and learning process. In addition, for many students, secondary education is the highest level of formal schooling they will achieve before entering the labor market.

Throughout the world secondary education is becoming mass education. Since educational expansion has changed the types and ability levels of students served by this stage of schooling, improving quality is not the same thing it was in the past. *A lower average socioeconomic background of the student body means that there is less academic support from home and that the schools must make greater efforts simply to maintain the existing quality of education.* Not only is the learning ability of the new crop of students more limited, but the content of what

[1] A companion paper, "Secondary Education in Latin America and the Caribbean: the Challenge of Growth and Reform" (EDU-111), by Laurence Wolff and Claudio de Moura Castro discusses several other issues related to secondary education.

they need to learn and can effectively master is different. Above all, they need different methods and pedagogy.

One problem that reformers need to address is how to manage the multiple roles that secondary education plays and the ambiguities that each embodies. The roles of both primary and higher education are quite clear. Primary schools are supposed to provide pupils with the social and cognitive skills that they need to function in a modern society (reading, writing, and math skills, as well as some knowledge of science). Higher education, for the most part, is job-oriented. It prepares students for their future careers and, in some cases, for elite roles (including public sector roles).

Another problem unique to secondary education is that the border between secondary education and whatever lower levels of schooling is often moveable or blurred. For example, sixth to ninth grade may be formally attached to the secondary or the primary level, or remain a stand-alone level (i.e., middle schools in the United States). This variation in modes of structuring schools complicates comparative analysis. But, in addition, the very nature of this intermediate level is unclear and differs from country to country. It may be an extended primary education in content and style of teaching or, it may be an earlier beginning of secondary education. This paper focuses mainly on "upper secondary education," that is, the last three or four years of the cycle.

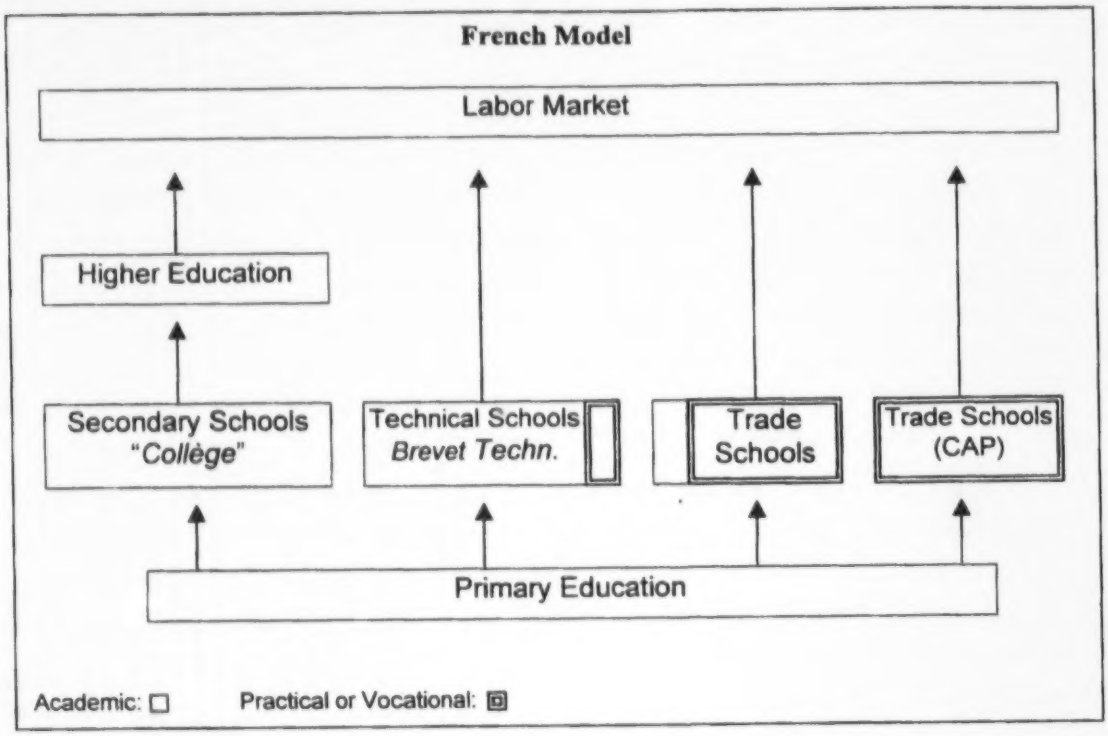
EUROPEAN AND AMERICAN MODELS

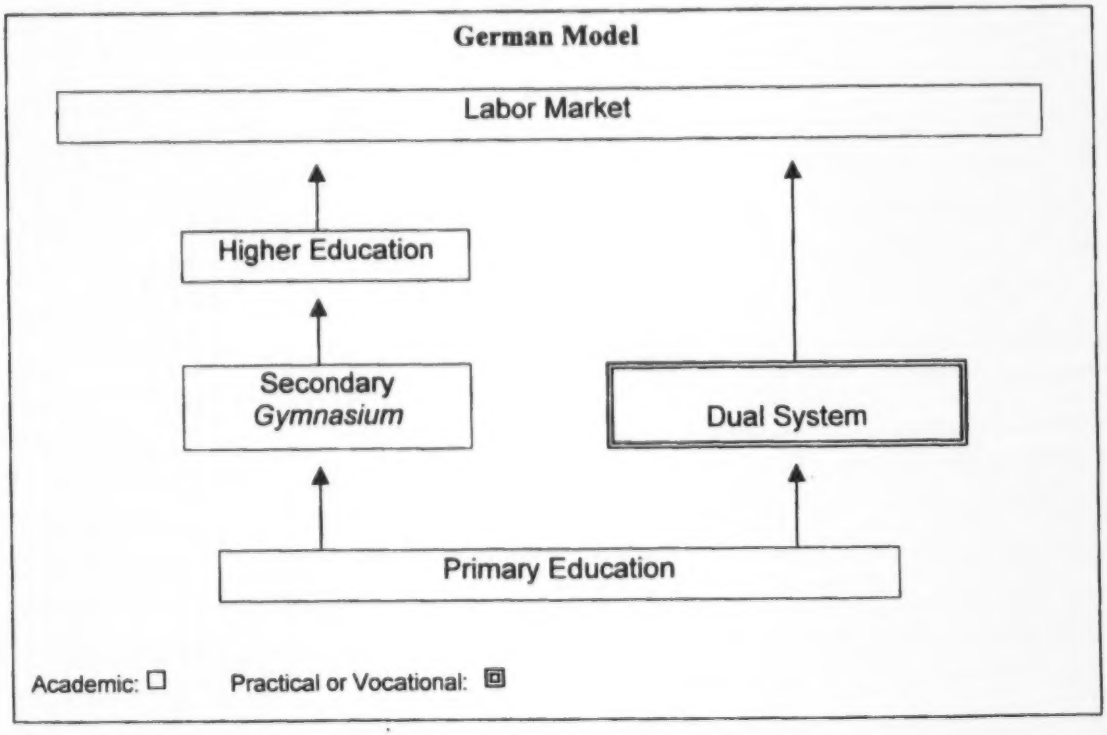
Europe and the United States and have faced the issues of massification of secondary education and conflicting goals for some time and have come up with hugely different responses. The essence of the European system is the existence of different schools and programs, each catering to students who have different academic aptitudes and aspirations for further studies.

Since France has been the source of inspiration for most countries in the region, it is important to understand the French secondary cycle. The main feature of the French tradition, which is similar to most other European countries, is the idea of creating a different school for each profile of student and for each educational trajectory. Students who want to learn an occupation attend a trade school and take a certifying examination (CAP—*Certificat d'Aptitude Professionele*). Those who have a greater academic aptitude but want to learn a trade can attend a *Licée Technique*. Students with a stronger academic orientation attend Baccalaureate secondary schools according to their area of interest. These secondary schools offer courses each stressing a broad area of study such as mathematics and natural sciences, humanities, commerce and so on. The Baccalaureate certificate ("Bac") is obtained after passing a strict and difficult examination. While the "Bac" gives legal access to higher education, some certificates are more prestigious than others and provide the student with an extra advantage if they want to be admitted into the most competitive universities and careers.

In Germany, Switzerland and Austria, close to two thirds of students take up an apprenticeship for a period of three to four years after completing at least 9 to 10 years of schooling. Students in apprenticeship programs attend school once a week where they take academic and technical courses. This model is highly successful in the Germanic countries despite some recent difficulties due to the economic problems of Germany. As a result, other nations continue to be interested in adopting it.

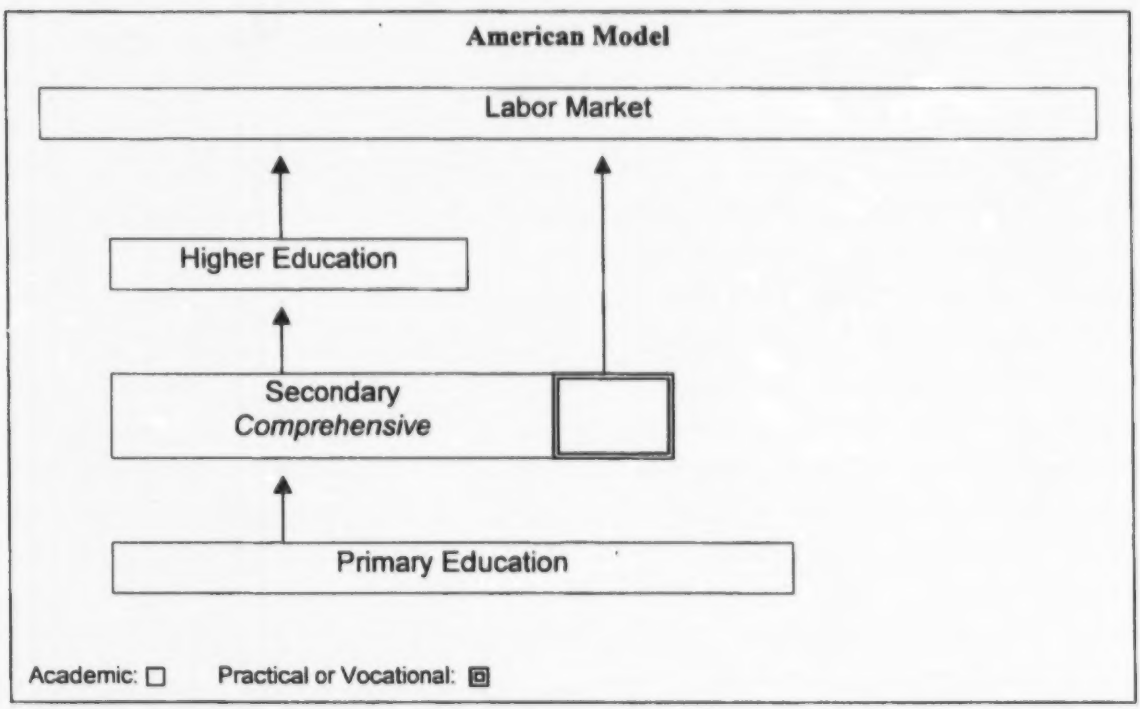
At the beginning of the century, American educators struggled between an European-styled system with a vocational track and the so-called diversified or comprehensive high school system which was finally adopted. Under this system, *poor and rich, academically or trade-oriented, all students go to the same school. The differentiation is made within the school.* Those students who are more interested in pursuing a higher education take more academically-oriented courses, while those who want to acquire a marketable skill take vocational courses. Some students take advanced placement honors or courses which may lead to college credits, while others take a less demanding version of the same course. Indeed, American high schools offer different levels of mathematics, English and sci-


French Model
Labor Market
Higher Education
Secondary Schools
"Collège"
Technical Schools
Brevet Techn.
Trade
Schools
Trade Schools
(CAP)
Primary Education
Academic:
Practical or Vocational:


German Model
Labor Market
Higher Education
Secondary
Gymnasium
Dual System
Primary Education
Academic:
Practical or Vocational:

ence courses even for those who are following an academic track. In addition, while keeping the same overall model, schools tend to cater to the typical students in their catchment area, thus, those in working-class regions focus more on vocational training. But all schools offer a vast array of disparate disciplines.

The model has served the United States for many years, but it has weaknesses. To some extend, the coexistence of auto mechanics, hair dressing, office technology, advanced calculus and seminars on Shakespeare has devalued both tracks. Vocational subjects have a low status and can be considered a punishment for students who are performing below academic standards. But real academic achievement, except in schools located in upper middle class neighborhoods, has until recently been equally denigrated. In many ways, the differentiation between categories of schools migrates into the inside of the school walls, making it more visible and perhaps more dysfunctional.



Secondary Education in Latin America: Outmoded Models and Low Quality

Almost all Latin American and Caribbean countries follow the French tradition and organize secondary education into a well-defined two-track system. One track prepares students for university and grants a secondary education degree (although not all students who follow this track attend university). The other track consists of various forms of professional/technical education intended to prepare students for work. The largest of these programs is teacher training, followed by commercial and industrial arts.

To set the stage for the discussion ahead, it is worth taking stock of the occupational training that takes place inside and outside academic schools. Table 1 shows the share of secondary school enrollment in general and vocational education. Note that the data are very imperfect, since names and denominations of programs are not comparable and statistics are unreliable.

In most Latin American and Caribbean countries, students attending secondary technical schools are a minority, averaging less than 30 percent of total enrollment for the region as a whole. In only in a few countries, notably Argentina, do the majority of students attend vocational, technical, and professional schools. In Mexico and the English-speaking countries of the Caribbean, 5 percent to 12 percent of secondary school students attend vocational schools. However, the meaning of technical schools can be elusive. Clerical, bookkeeping and teacher training are often counted as technical, even though these courses are quite different from the classical manufacturing sector technical programs. To complicate matters further, most Latin American countries have large training systems that operate at the margin of academic schools.[2] Given the significant occupational training offered by them, examining only what academic schools offer yields a very distorted picture of occupational training.

In every country, with little exception, academic education has had higher status than vocational/technical education (mainly because of the differences in social class of the students in the two tracks). But this has not prevented enrollment in the technical track in some countries, such as Ecuador and El Salvador, from expanding even faster than the academic track (Carnoy and Castro, 1996). And the exceptions can be important, as is the case in Brazil whose SENAI and federal technical schools are very expensive and cater to the local elites.

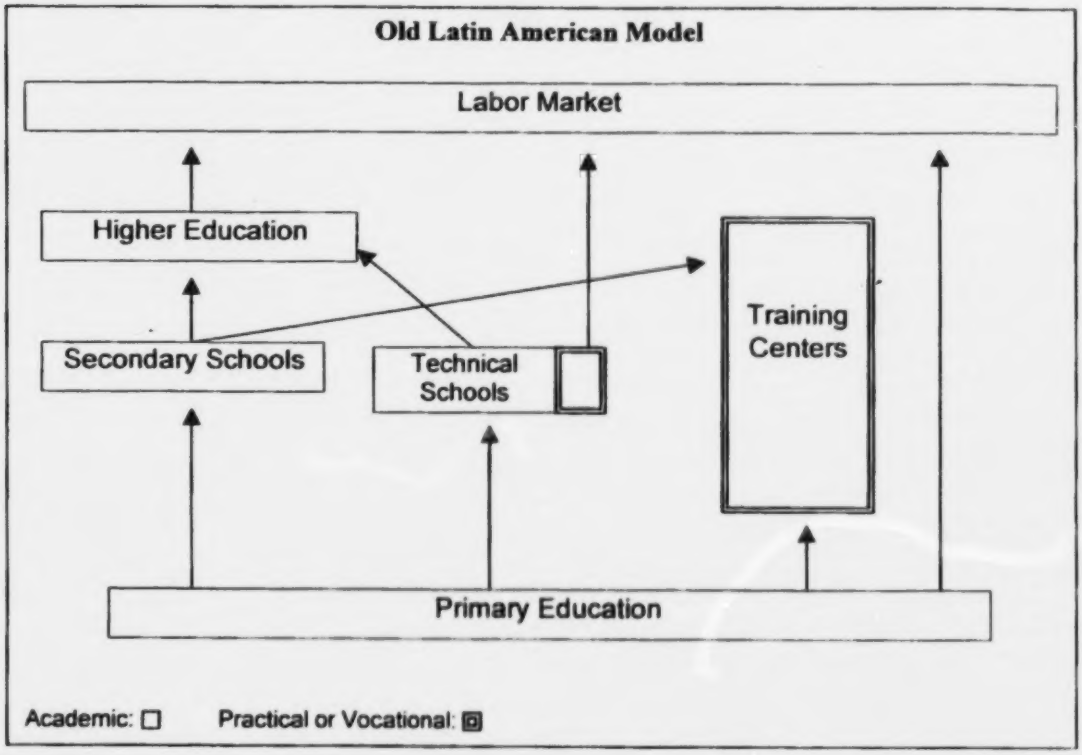
It is interesting to note that the countries of Latin America (but not the Caribbean) part company with the European tradition of strong examinations at the end of the secondary cycle (*baccalaureate, maturité, abitur,* A Plus, etc.), and is more similar in this respect to schools in the United States. The absence of rigid criteria for obtaining a secondary diploma has at least three consequences. First, lower criteria means less pressure on students and schools—a bad feature. Second, schools are less polarized around examinations (with the exception of those predominantly catering to students who want to enroll in the most competitive universities)—a good feature. Third, the system avoids a painful but common situation where an overwhelming proportion of the students fails to get a secondary diploma and are branded as failures. (This happens, for instance, in the Maghreb countries which set standards comparable to those of the

[2] For a discussion of these training systems see Castro, 1998.

Table 1: Shares of General and Technical Education Enrollment at the Secondary Level (Most Recent Estimates)

Country	Year	% Gen. Ed.	% Voc.-Tech.
Latin America and the Caribbean			
Argentina	1985	40	60
Belize	1994-95	99	1
Bolivia	1990	---	---
Brazil	1985	33	49
Chile	1996	56	44
Colombia	1993	76	21
Costa Rica	1995	78	22
Dominican Republic	1994-95	91	8
Ecuador	1992-93	66	35
El Salvador	1993	25	74
Guatemala	1980	70	17
Guyana	1994-95	100	0
Haiti	1985-86	97	2
Honduras	1991	65	30
Jamaica	1985-86	96	4
Mexico	1994-95	89	11
Nicaragua	1993	92	7
Panama	1990	74	25
Paraguay	1994	92	8
Peru	1995	100	0
Suriname	1992-93	59	35
Uruguay	1995	84	16
Venezuela	1992-93	82	18
North America			
Canada	1994-95	100	0
United States	1994-95	100	0
Central and Eastern Europe			
Bulgaria	1995-96	72	28
Croatia	1995-96	64	36
Czech Republic	1994-95	56	44
Hungary	1994-95	27	73
Poland	1994-95	29	71
Russia	1993-94	91	7
Ukraine	1993-94	89	11
(Former) Yugoslavia	1990-91	66	33
Yugoslavia, Fed. Rep.	1995-96	66	34
Western Europe			
Austria	1994-95	61	38
Finland	1994-95	71	29
France	1994-95	72	28
Germany, DDR	1985-86	75	25
Germany, FDR	1985-86	64	36
Italy	1993-94	56	40
Norway	1994-95	68	31
Spain	1994-95	75	25
Sweden	1994-95	69	31
Switzerland	1993-94	67	31
United Kingdom	1994-95	61	39

Source: UNESCO, Statistical Yearbook, 1997, Table 3.7.



French *Bac.*) Do the gains from less rigid standards offset the losses? There is no right answer to this question.

As secondary education expands, its selection function also changes. In most Latin American countries (with some notable exceptions, such as the countries of Central America and the poorer regions of Brazil), lower secondary education (grades 7 to 9) is becoming the top level of schooling with which most young people enter a rapidly changing workplace. In the middle-income developing countries, including many Latin American economies, even upper secondary education (grades 10 to12) is becoming mass education. As a consequence, large numbers of students from previously "excluded" socioeconomic strata have completed secondary education. Their average "cultural capital" (Bourdieu and Paoserou, 1990) is considerably lower than those of previous generations who attended secondary school. A generation ago, upper secondary education prepared a relatively small group of students (largely pre-selected at lower levels of schooling) either for university or for technical occupations requiring only secondary education. Now it selects and prepares a much larger group for further studies in higher education and separates them from a second group that is headed for a still ill-defined post-secondary training. It also creates a third group that enters directly from secondary school into the labor market with what are now considered inadequate levels of general knowledge of math and language.

Ministries of education have long been concerned about the growing number of students who graduate from academic secondary schools but do not go on to receive a higher education or occupational training. If nothing else, this is a source of dissatisfaction and unrest. Yet, the evidence is unclear on whether these graduates do worse in the job market than technical school graduates, particularly compared to students who graduate from technical schools of low quality or those which are not associated with particular industries or employers. The empirical

evidence does not support the argument that, on average, academic secondary school leavers who do not go on to university are worse off in the labor market than vocational/technical school graduates. Yet, the comparisons between academic and vocational/technical secondary schools are complicated by a number of issues, including the rate of growth of the economy, the quality of links between technical schools and enterprises, and the lower socioeconomic background and weaker academic ability of students attending technical schools. In fact, what these comparisons hide is the overwhelming importance of the quality of the school. Typical technical schools are inexpensive and poorly equipped, recruit weaker students and produce ill-prepared graduates, and they have low prestige. On the contrary, graduates of more expensive and better-equipped schools often excel.

The choice between purely academic or a purely vocational education is a controversial subject, even after much has been written about it. While the use of rates of return to analyze education is fraught with methodological problems, comparisons between different programs offered at the same level of schooling is a relatively safe use of this tool. At least until recently, rate of return data suggested that the average payoff to investment in secondary vocational/technical education is lower than that to academic secondary education. The caveat to this assertion is that these are mainly countries with low economic growth rates (see, for example, Psacharopoulos and Vélez, 1992, on Uruguay, showing much higher private and social rates of return to investment in academic secondary than technical education). But this point is subject to debate (see, for example, Psacharopoulos and Fiszbein, 1991, on Venezuela, showing somewhat higher rates of return to technical than to academic secondary education). In more rapidly growing economies, such as Hong Kong, the rate of return to technical education for occupations that are in great demand (electronics, for example) is higher than to investment in general secondary education. However, the rate of return is lower in the case of other occupations that are in lesser demand (Chung, 1990).[3]

The expansion of secondary education in the region has exacerbated the already persistent ambiguities in preparing youth to become skilled workers. The occupational profiles of the graduates prepared by industrial vocational education were never very clear. As industrial training moved higher in the secondary cycle (and as the heterogeneity in the technical sophistication of Latin American industry increased), the focus of such education became even less clear. Should industrial training produce workers, technicians, or supervisors? *Ambiguities in focus have ended up producing graduates who are neither competent skilled workers, technicians, mid-level supervisors or competitive in the entry tests for higher education.*

The changing role of secondary schools, from relatively elite to relatively mass education, is prompting reformers to rethink its structure and the kind of teaching and learning that takes place. The quality of secondary education in the region is considered to be too low to adequately prepare students for the socioeconomic environment and requirements of the 21st century. This observation applies to secondary schools that prepare students to enter university as well as to technical secondary schools—whether or not the students ultimately attend university. The bottom line is sobering: *The simple two-track model needs revising. Both the academic and the technical track offer a particularly weak education and some of the shortcomings are common to both.*

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[3] In Germany, with its "dual system" of apprenticeship, the tendency for companies now is to rank gymnasium graduates among their top recruits into apprenticeships (Greihert, 1992). In other words, the vocational stream increases its intake of students with an academic secondary diploma. Research in Brazil suggests that graduates of good vocational schools (SENAI) earn higher incomes and have greater occupational mobility than those who had up to five additional years of academic education and on-the-job-training (Castro and Mello e Souza, 1974).

The failures of secondary education in the region are not simply the result of a poor choice of models. A separate paper examines weaknesses in goal setting, evaluation, management, teacher training, and financing (Wolff and Castro, 2000). In particular, major changes are needed in teacher preparation whether for academic or technical teaching. The process of teaching and the curriculum need a much greater focus on higher standards, problem-solving, and participative teaching-learning. In addition, vocational-technical education (including teacher education) needs to emphasize practical, job-oriented curricular approaches to improving students' problem-solving capacity and providing them with job skills for the 21st century.

It should be noted that attempts to establish diversified secondary schools following the American have proven unsuccessful in Latin America. The U.S. Agency for International Development and the World Bank financed several failed attempts to establish a secondary system based on the U.S. model. In the early 1970s, Colombia, Venezuela, and Panama attempted to introduce diversified curricula into secondary schools; Peru also experimented with comprehensive high schools (Corvalán Vasquez, 1984). *It seems that the presence of higher status internal tracks created a strong prejudice against the manual occupations, thwarting attempts to prepare students for them.*

Perhaps the most ambitious attempt was the establishment of expensive and well-supported schools, following the American model (INEM) in Colombia, which received strong World Bank backing. They created a strong organizational culture, offered a solid education, and are still around. The problem is that they are too expensive to be replicated and the vocational end is just what it is in the United States; namely, exposure to a variety of different activities within the school walls. It seems that the high selectivity and consequent elitization of the student body frustrate the vocational objectives.

Limited attempts to export the German model have also been generally unsuccessful despite the fact that some met with success. The model's shortcoming, which hinders its large-scale replication, seems to lie in the fact that it requires an institutional organization and a level of information and dialogue between social partners that is uncommon even in other European nations. It is interesting to note that the United States has met with a measure of success with these schemes, which have worked well with dropouts. Elsewhere, however, these experiments remain limited in scope.

Nevertheless, this model is worth keeping in mind because it remains attractive and feasible in small and well-controlled experiments, particularly in areas where technology changes very rapidly and schools are unable to maintain up-to-date laboratories and workshops. Moreover, these tend to be critical skills for the competitiveness of some industrial sectors. The German model is also viable in the case of training programs within large enterprises. For example, local branches of German firms have been successfully operating dual apprenticeships for many years.

New Models and Options

What are the options for replacing existing organizational structures in secondary education? The challenge is formidable. In addition to resolving the academic/vocational dichotomy in secondary education, potential solutions must convert academic secondary education into a more general, high quality, problem solving extension of basic education, successfully retaining the increasing numbers of low-income students who are the new clientele of academic "university prep" education. At the same time, secondary education has to provide high quality job training for the large numbers of students who will enter the labor market out of secondary school or whose post-secondary vocational education is limited. *Some important issues that must be considered are where to put job-oriented training, how late or how early to offer it, and how separate job training should be from mainstream academic education.*

Another side of the equation to be considered is student (or parent) demand. Primary education offers about the same formula to all, just about the only decision in the hands of parents is whether they send their children to private or public schools. Therefore, at the primary level the demand is irrelevant for all practical purposes. Demand becomes important in secondary education where different formulas are offered and the option to stay out of school is acceptable. If children do not enroll in sufficient numbers or if they enroll in the wrong school (e.g., enroll in technical schools but are interested in the academic diploma), problems will remain unsolved regardless of the alternatives devised. Therefore, the degrees of freedom of the planner are much more restricted in designing secondary education.

The key to clear thinking about the interplay between academic and vocational contents starts by *not mixing up the relationship between theory and practice with that between theory and job-oriented subjects*. When academic subjects are not linked to vocational preparation, it is imperative that they be as applied to the real world and to practical activities as is often the case in the academic-*cum*-vocational solutions. In sound academic schools there ought to be practical applications, explorations of the real world, experimentation and research. Laboratories and workshops are meant to educate the mind via experiments and the construction of real objects and processes. This is in contrast to shop, which is meant to teach a trade and prepare students for employment.

A good education blends theory and practice. Practice gives meaning and concreteness to theory and allows a deeper understanding of concepts. Theory lifts occupational training out of manual and repetitive routines, giving it a broader meaning and the potential to transfer learning from one situation to another. Schools can be organized in such a way that occupational training is the concrete counterpart to the conceptual development offered by academic subjects. But they can also bring practical content to academic programs without an occupational orientation. In fact, this is what high quality schools have done for a long time.

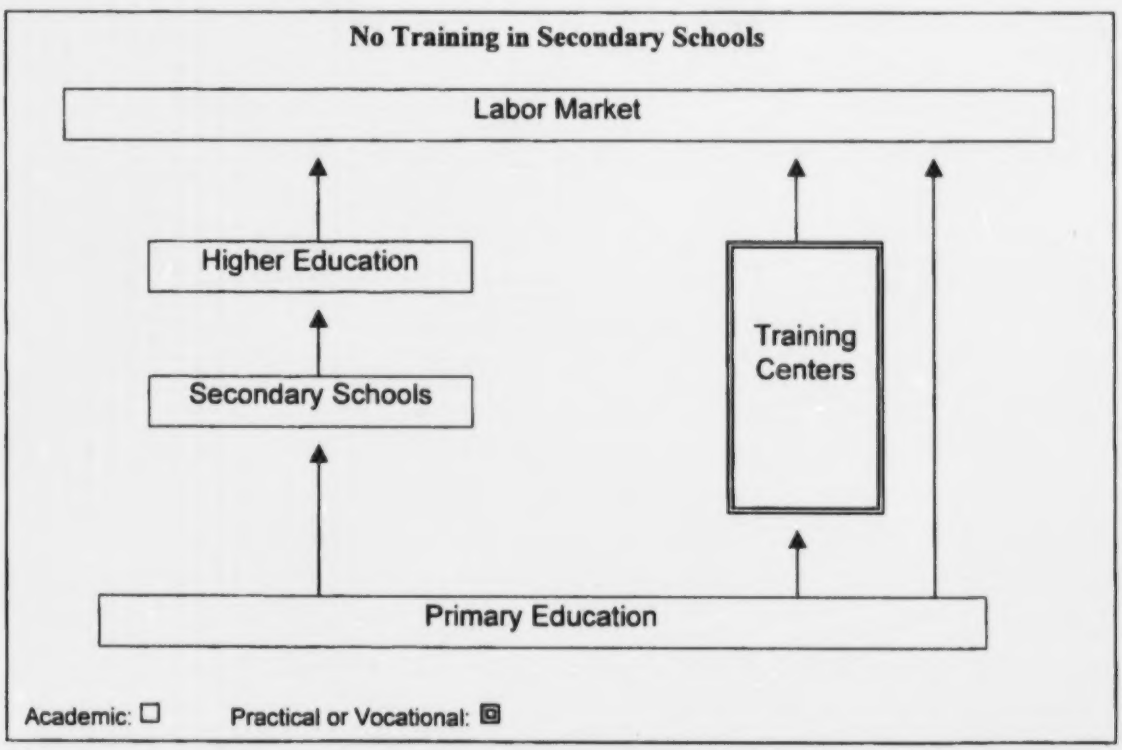
Below we present some of the new solutions that are being proposed or implemented. Notice that these are not mutually exclusive alternatives, since most countries tend toward greater complexity, offering students many alternatives. Hence, what follows is a description of trends and possibilities that work under the right con-

ditions, not a description of ideal solutions. There are five potential solutions, all of which could be valid within the context of a particular country:

- separate job training from formal secondary education;
- move technical education to the post-secondary level;
- create tracks within formal secondary education;
- develop a single national curriculum with electives;
- build academics into vocational subjects;
- blend office technology into academics; and
- maintain a few elite secondary technical schools closely linked to industry.

SEPARATE JOB TRAINING FROM FORMAL SECONDARY EDUCATION

The number one challenge of vocational and technical schools throughout the world is the difficulty of matching the training to existing jobs and maintaining the relevance of that match. This is the acid test for such institutions. Although the demand for workers may have been good when the courses were originally developed as markets evolve and the number of graduates rises, demand may fall off. However, experience shows that there is inertia in the adjustment process and that the incentives to cut enrollment and find new market niches are few. The inertia is even stronger when the vocational or job-oriented program is coupled to an academic degree. First, it makes little sense to reduce or increase educational opportunities at the trough of the business cycle. Surely, schools should not be closed when unemployment increases, but it might make sense to reduce offering of a job-specific training when there are no jobs available in that particular occupation. While education has a *raison d'être* that goes



beyond immediate jobs, training does not. Second, given present patterns of organization, schools are usually not rewarded when they adjust to shifting markets, while change has a political cost for those who undertake it. The result is inertia: technical/vocational courses are offered long after the job market is saturated with graduates. But just as important is the powerful *ethos* of academic schools that overpowers the lower status of the job-training end of the school, further confusing its goals.

While most experiments to add vocational content to regular academic schools have met with very limited success, the region is the site of a number of highly successful outside-of-school, payroll-tax financed, publicly (and privately)-run vocational training programs and a few innovative alternatives to traditional vocational education. Good examples are Serviço Nacional de Aprendizagem Industrial (SENAI), Serviço Nacional de Aprendizagem Comercial (SENAC), Serviço Nacional de Aprendizagem Rural (SENAR), and Serviço Nacional de Aprendizagem do Transporte (SENATI) in Brazil, Servicio Nacional de Aprendizaje (SENA) in Colombia and the Instituto Nacional de Aprendizaje (INA) in Costa Rica.[4] The presence of these alternative vocational systems is not without consequences: it permits the existence of secondary school models which offer a minimalist menu of occupational training options, leaving the tasks of real vocational schools to this parallel system. Even though these system have faced problems of their own in recent years, *the alternative of removing vocational preparation from academic schools altogether has gained acceptance in the discussion of new models of secondary education.*

[4] Whereas public spending for academic and technical education in Latin America was held down, even during the economic recovery beginning in the late 1980s, private sector growth produced increases in payroll taxes, expanding such programs. They are primarily–but not exclusively–for workers who hold jobs and are sent to the programs for training by employers. See draft of IDB Vocational and Technical Training Strategy.

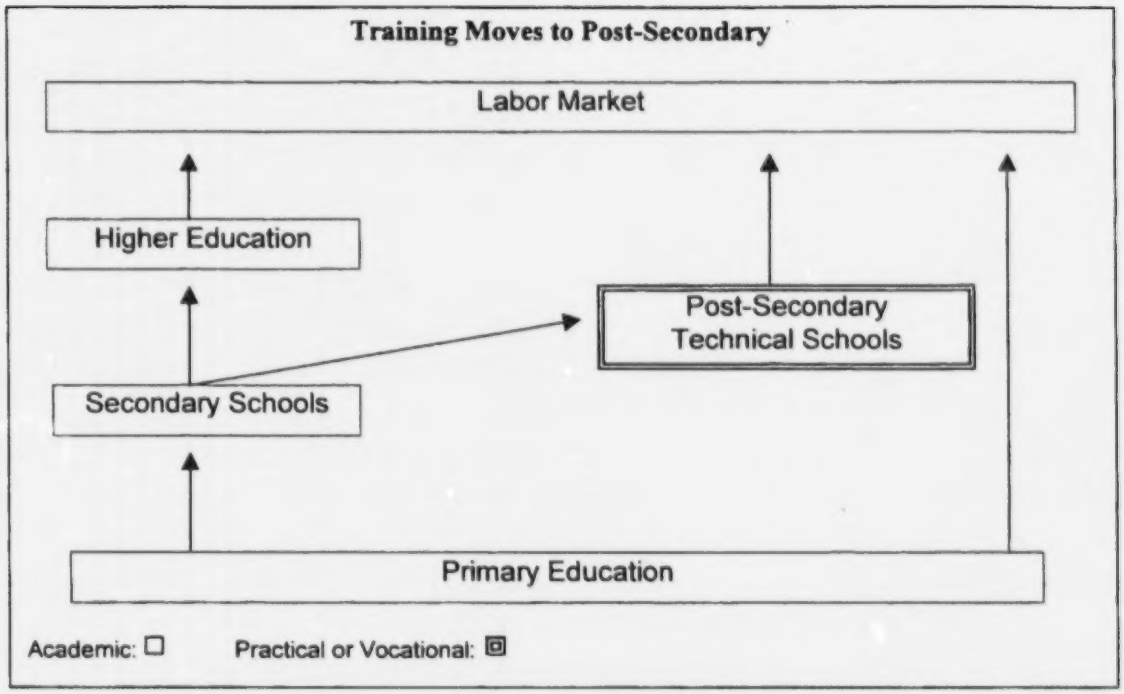
MOVE TECHNICAL EDUCATION TO THE POST-SECONDARY LEVEL

There is a worldwide trend toward pushing technical education into the tertiary level that coincides with rising levels of education and increases in the conceptual requirements of skilled trades. Some Latin American countries are expanding relatively low-cost polytechnics or community colleges at the post-secondary level. The range of names and titles for these initiatives is wide: *técnicos*, *tecnológicos*, *terciaria no universitaria*, *politécnicos*, *colegios técnicos*, and others.

Higher level education in Latin America increased more slowly than in other regions, yet 3 million students were added to the rolls between 1980 and 1992 (UNESCO, 1995). With 17 percent of the age cohort enrolled, Latin America places second (behind the newly industrializing countries of Asia) among the developing regions of the world in the proportion of students reaching the tertiary level. In both the secondary and tertiary levels, Latin America leads the developing world in the percentage of young women enrolled and in the percent of women university graduates.

Mexico has developed a system of tertiary polytechnic institutions, which have been particularly successful in high growth regions of the country, such as the border area with the United States. Mexico's polytechnics are linked to local businesses, where students work part-time while pursuing their studies as part of their training program. Venezuela also has a long history of public and private post-secondary programs.

These types of institutions have also increased in number in Chile; however, most are private and not subject to government monitoring or inspection. For all practical purposes, these are considered private businesses, conducted by proprietary institutions and controlled by market forces. A similar situation exists in Argentina where there has been a tremendous increase in the number of so-called *terciaria no universitaria* following a long period in which private institutions were not favored by official policies. These courses of study are mostly offered by



proprietary institutions of mediocre or low quality. To increase the level of offerings, there has been an increase in provincial initiatives to create publicly-financed post-secondary institutions, which would offer courses of short duration. In Brazil, growth in this area has been slow (except for the private sector in information technology). However, the recent split of technical education from the secondary level makes most of the courses *de facto* post-secondary programs since there is a strong tendency to offer them to students who already have a secondary degree. With substantial external support, these courses are expected to grow.

One problem with this solution, particularly in case of countries where the rate of secondary completion is low, is the premature elitization of training. Poorer youths who are not able to reach this education level may be unable to gain training opportunities. In addition, the fact that they are de facto considered higher education puts these courses in competition with more traditional careers at this level, a challenge which Europe and the United States met with relative success but with which Latin America is still struggling.

CREATE TRACKS WITHIN FORMAL SECONDARY EDUCATION

Some recent reform efforts have evolved into a secondary system based on the separation of tracks, focusing on several broad areas of knowledge but removing preparation for jobs from mainstream secondary programs. This is similar to the French system of offering different Baccalaureate tracks.

This system is organized around broad technical categories, such as liberal arts, biological sciences, commerce, and applied arts (visual, graphic, etc.). It can be understood as a somewhat specialized academic secondary education or a general technical education. It costs about the same as traditional secondary education and is intended to prepare students for entry into post-secondary institutions, into jobs offering on-the-job training (such as business and commerce occupations), or as an introduction to job-specific training to be taken subsequently. This type of technical education is expanding rapidly in the secondary education systems of the region. Mexico and Argentina, for example, have

created *polimodales* which offer different tracks within academic education.

If properly implemented, these schools hold promise. In general (although not in every case), broad-based knowledge geared toward problem solving seems to be more valuable to graduates over their work lives than specific vocational skills because it enables graduates to "adjust to disequilibrium" (Schultz, 1992). In the increasingly flexible labor markets of the new global economy, a general knowledge of mathematics, science, computers, and language that prepares graduates to learn a variety of specific, job-related skills (on the job or in short training courses) appear to have become more valuable (Carnoy, 1995). Surveys of employers in the United States suggest that in addition to basic cognitive abilities, they most value communication and cooperation skills in new hires (Capelli, 1992). But there may be exceptions to this rule, especially for technical education linked closely with employers and high quality on-the-job training (described below). On the negative side, this structure can create a set of second rate tracks, reminiscent of what happened to vocational programs within academic schools.

BUILD ACADEMICS INTO VOCATIONAL CONTENT

American high schools are wed to offering a combination of academic and vocational courses in the same institution. Just about all schools adopted this scheme in the early 1900s. However, the link between the academic track and the scattered vocational disciplines has not been seamless and lack of effectiveness has plagued the vocational tracks. In the last ten years, the United States launched a new and better-structured version of this option, seeking to build in broad problem-solving skills into vocational content. This effort met with considerable advantages and success. Two federal programs, the Applied Academics and the Tech Prep movements, structure and fund these experiments in the United States (Hull, 1995). The key under these new orientations is to use vocational subjects to frame "situated" or "contextualized" learning of academic subjects (for instance, mathematics is learned as a tool to calculate the gauge of wiring for an electrical circuit). The idea of bringing practical and enterprise experience closer to academic subjects is not different from what German or Swiss apprenticeships do. Indeed, the Tech Prep program is a variation of apprenticeship training. Students who want to move immediately into the labor market can benefit from taking courses that delve into the specifics of the occupation chosen. Depending on the occupation, the courses could be short (e.g., hairdressing) or take much longer (electronics). When these courses come after a sound academic education, they can be much shorter and specifically tuned to labor market needs.[5] Yet, there are differences. The Germanic dual system takes place in institutions which have no administrative links with regular academic schools. Tech Prep, by contrast, is an add-on to existing high schools.

Latin America has not yet moved in this direction, perhaps because the potential target population in has already dropped out of secondary (or primary) school. Yet, there are good reasons to believe that some of the ideas and, in particular, the concepts and learning theories behind them can become a good source of inspiration.

DEVELOP A SINGLE NATIONAL CURRICULUM WITH ELECTIVES

Brazil and Trinidad and Tobago are experimenting with an adaptation of the American comprehensive school. In Brazil, a single national core academic curriculum will comprise 75 percent of the disciplines. The remaining disciplines will be offered at the discretion of individual schools and may include vocational of-

[5] Some of the solutions mentioned below–which postulate the separation of job training from academic schooling – have met with strong objections from in areas. However, the previous paragraph tries to demonstrate that this criticism is not justified. Preparing for jobs is not an add-on activity that can be reshuffled around freely. The integration of vocational content to the academic curriculum allows the creation of bridges between academically-oriented subjects and job-oriented subjects, which enrich both. But that is not to say that this is the only solution or that it is a solution which is able to overcome some of the objections mentioned before. But of course, any of these solutions require better teachers, a chronic shortcoming of Latin American education.

ferings. Classical technical and vocational training (particularly for the manufacturing sector) would either be offered in parallel or moved up to the post-secondary level. In Trinidad and Tobago classical vocational schools are being replaced by single-curriculum schools, but with options to create "magnet" subjects which can draw studnets from the entire island.

These models are simple and elegant. Yet, a single curriculum can be a problem in countries with highly heterogeneous students and schools. For instance, if the mathematics syllabus includes derivatives and integrals, students with low scholastic ability will gain little (and forego learning more applied elements of this discipline). However, if these subjects are not in the syllabus, engineering-bound students may be deprived of this vital background. One approach would be to require a "minimum" level of, say, mathematics achievement and then to encourage schools to go far beyond this level for the more motivated students. Ultimately, this is *the ugly face of the decision to offer the same education for all, or a watered-down or more applied version to the less academically able*. There is no way to escape this unpleasant issue.

BLEND OFFICE TECHNOLOGY WITH ACADEMIC CURRICULA

While the incorporation of technical/vocational training into secondary education raises various problems, business and commercial subjects are much more congenial to the *ethos* of regular schools. These programs can be large, as is the case with bookkeeping and secretarial programs, which are a favored choice for students of less affluent background. In fact, by the beginning of the 1980s, more than half of the enrollment in technical and vocational programs was in business education for clerical/commercial jobs. Unfortunately, these programs desperately need to be reformed. For example, they tend to teach an old and stale version of legalistic bookkeeping, without computers and without a clear focus on managing small enterprises.

The present trend to "academize" secondary-level technical education for office work may be an important step toward making secondary education more interesting for the region's youth while not locking them into specific vocational skills. Technical education of this type uses job-oriented courses (largely business and commercial jobs) to make mathematics, computers, science, and language more interesting and relevant to students who do not do well in a traditional academic environment. The concept is to increase cognitive ability using techniques that involve students in new ways.

Some of the vocational skills that are taught at those programs are just as well general education for a modern economy. Using a computer is a vocational skill for an office worker but it is also general education for everybody else. It is hard to imagine someone with a secondary education who will not be soon using a computer, even in Latin America.

The business-academic mix is much more likely to succeed than the traditionally antagonistic combinations of academic and industrial arts. Business skills are "paper and pencil," much closer to the *ethos* of academic schools. Moreover, the demand for people with these skills is not generally subject to large fluctuations.

Although there is no definite evidence that career education increases the employability of graduates, compared with traditional academic tracks, it does appear to improve retention rates and learning (Stern et al., 1994), and the likelihood that some students will go on into tertiary level technical education. It is interesting to note that some years ago, research on the vocational trades taught at American high schools revealed that business programs for girls were highly successful in leading them to jobs, at the same time that the record for other skills was, at best, mixed.

MAINTAIN A FEW ELITE SECONDARY TECHNICAL SCHOOLS CLOSELY LINKED TO INDUSTRY

Most Latin American technical schools are totally disassociated from labor markets. The staff of these schools knows little about the labor market that their graduates will enter and fail to maintain a close working relationship with the businesses that might hire them. This is part of the reason that they can remain insensitive to

changes in the occupational characteristics of the labor force and to the obsolence of their curriculum. However, there is a small number of elite high level technical secondary schools that are tuned into local labor markets and also provide their graduates with a broad academic preparation as part of the "technical" curriculum. Such schools are the technical training equivalent of the best academic secondary schools and tend to comprise a minority of schools that select the ablest students.

A number of studies have argued that courses of this type that are closely tied to jobs and industries present major advantages over preparing students in programs not directly linked to jobs. Since the specific skills learned in vocational training require constant updating, close links with the labor market are absolutely essential if the education is to be relevant and the students are to acquire marketable skills. However, skills must be put to work quickly, otherwise they can be lost. Educational programs that enable students to be employed immediately yield much higher returns to both employer and employee.[6] Chile has experimented with turning over the management of some of its secondary technical schools to associations of industries while still providing substantial public financing. The positive side of this strategy is that once accepted to such schools, students have an "inside track" to employment in the industries associated with the schools. Students seem to have a much higher likelihood of getting work after completing the courses, and they have access to internships while in school. The drawback is that such schools may be quite expensive (Chilean students attending industry-run technical schools receive a voucher that is five times the amount of a voucher for a sciences/humanities program). Already, close to 20 percent of students in technical/professional secondary education are in schools run by associations of employers (Comité Técnico, 1994, Table 1). Industry-run technical schools have existed for decades in Monterrey, Mexico, where they are also entirely publicly funded.

In Brazil, SENAI operates about two-dozen technical schools operated (not to be confused with their 700 hundred odd vocational schools geared to crafts and industrial training). These schools operate very close to firms and tailor their curricula and offerings to their needs. But in the last two decades they have started offering quality control and physical assay services to industry, since they often have laboratories that are better equipped than those of many firms and have progressively moved to technical information about products, markets, processes, and new equipment. They are beginning to provide technical assistance, trouble-shooting technical problems, industrial layout, organization and method studies and lately, total quality and ISO 9000 norms, improving the efficiency of processes and machines, retrofitting old equipment with numerical control devices, doing market research, and developing new products or new uses for old products or rejects.

To sum up, it is possible and highly desirable to create technical schools that operate very close to the productive sector and benefit strongly from this proximity. These can be highly effective schools. Yet, they need have certain requirements to yield the best results, in particular, sufficient resources and alert management.

[6] A parallel adjustment in these programs has to do with the redefinition of graduates. The old programs tried to prepare supervisors rather than skilled workers. The new tendency parts company with the former understanding of technical education (of European tradition) as a preparation for intermediate management, i.e., those who stand between the engineers and the skilled workers. There is considerable ambiguity in this area, as modern organizations shrink intermediate cadres and most firms have always preferred to promote their best workers to supervisory roles rather than use out-of-school technicians on those positions which involve managing highly experienced line workers. By contrast, the "new" technician is a worker, not a foreman. He is the worker of the technically complex processes. The mechanic fixes automobiles but the mechanic who fixes computers is a technician. The new breed of technicians corresponds to the "high tech" mechanic, not the supervisor. Rather than supervisors, this new breed of courses and schools prepare students to be workers in well-defined occupations, such as X-ray technicians, car mechanics, computer technicians, maintenance technicians and so forth.

Lessons

The first lesson is very clear: *the traditional structure of secondary education is obsolete*. It neither offers a sound academic education that is compatible with the needs of a modern society nor does it handle well the task of preparing some students to enter the labor market. However, there is *no single new model* which can be recommended to all countries of Latin America. Advanced countries adopt different models, and several of them are also in the process of transforming their own systems. In addition, *cultural traditions cannot be ignored* under the new choices.

Yet, a few major conclusions can be highlighted:

- In many new alternatives there is a *progressive separation of vocational preparation from the academic streams* (the major exception being in the areas of business and office training which have a natural affinity with academic studies).

- In many cases, technical courses are pushed to the post-secondary level.

- In others, the technical tracks become less an occupational training than an academic education with emphasis on some broad family of occupations.

- The most successful technical schools, at any level with or without academic studies, are closely tied to industry, even though they account for a small percentage of total enrollment.

- In all cases, there is the need to *make theory more applied, more concrete, more focused on solving problems, rather than being the memorization of facts and theories*. Notice that *being practical is not the same as being vocational* and one of the new tendencies is to make academic education practical and concrete but not vocational. This is true both for academic and vocational education, as academic needs practical applications and vocational needs stronger theoretical foundations.

Careful observation of the real world allows the above conclusions to be reached without resorting to conflictive value judgements. However, two options *remains highly ideological as well as problematical. One is the alternative that offers the same syllabus to all students. The other is the alternative to track students and offers easier or more applied programs to some and academically more demanding paths to others.*

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